Española Elementary Students Honored By First in Math® Inventor

By Lorenzo Gonzales and Melissa Salazar, MSA Master Teachers

Española Public Schools' elementary students are First in Math, again.

Robert Sun, the *First in Math*® Online Program inventor and CEO of Suntex International, and his Vice President, Barbara Asteak flew in from Philadelphia, Pennsylvania to honor the top performing *First in Math*® elementary students from across the Española School District.

The event was held May 5, at the beginning of the school day at the James H. Rodriguez Elementary School library. The room was packed, full of elementary students, their proud parents, teachers and principals. Española Public Schools' elementary students won *First in Math*® honors last year as well. Mathematics teams from both Velarde and San Juan Elementary Schools are currently the top mathematics problem solvers in New Mexico and are in the top ten teams in the nation. The district's *First in Math*® teams have calculated an incredible number of math problems (4,825,575).

It is difficult to fathom how many times these solved math problems would circle the earth if placed end-to-end around the earth's equator, but it is not difficult to understand that if all these millions of solved problems were to be scattered over the state of Rhode Island—they would make a mess. Let's see, 20 problems per worksheet divided into 4,825,575 problems—about 241, 278 pieces of paper would be scattered all over Rhode Island.

The *First in Math*® Online Program was first introduced to the district by Emmanuel Espinoza, an Española District/LANL Math and Science Academy math coach (MSA). He studied the game's effectiveness as part of his participation in NMSU's Mathematically Connected Communities project (MC^2), an MSA higher education partner.

Last year, MC^2 paid the licensure fee for the district. In the first month, so many teachers and students logged on to use it that it ground the Española School's Internet speed to a halt.

Two years and many increases in bandwidth later, *First in Math*® is firmly established in Española schools. All Española elementary school students have access to the *First in Math*® Online Program through a two-year contract. They can access the program at school as well as at home.

Most people are comfortable stating that they "are bad at math, and that they have always been bad at math, and that they will continue to be bad at math because they are missing the math gene. It's not their fault. To be good at math is a gift from above." This is a disclaimer heard all over the nation not only in Española or New Mexico.

Well, welcome to the new math clinic that quietly opened three years ago in the confines of Española elementary schools under the guidance of MSA.

One of the reasons for its popularity among Española teachers is that *First in Math*® is much more than a game. The *First in Math*® Online Program is an electronic mathematics program that quickly and efficiently provides the student with challenging math problems and rewards in a game

environment. The games provide an engaging and challenging space with immediate feedback and rewards for students in the form of operation clues and electronic stickers. Students improve their fluency and flexibility with numbers through deliberate practice. In the words of Robert Sun, "these mathematics exercises strengthen automaticity with basic facts and support any core curriculum."

"There is no magic to learning mathematics. It is not a trick," says Española's Math Coach for 6th-8th grades, Emmanuel Espinoza. "It is good teaching and hard work on the part of both the teacher and student," Espinoza continues.

Practice makes perfect, the saying goes, but instead of spending huge amounts of time duplicating hundreds of math problem worksheets, Española teachers have hit upon the team concept of practicing fundamental math skills electronically. No more wasteful use of paper, no more grading of problem worksheets, and the rewards for correctly calculating number and operation as well as algebra problems are immediate and electronically recorded in an easily retrievable online log for each student and team, says Norma Lara, a San Juan Elementary 6th grade teacher whose team is the number one team in New Mexico and sits comfortable with the top four teams *in the nation.*

According to this "deliberate practice" notion, anyone can become fluent in mathematics. Students in Mr. Jimmy Lara's and Norma's 6th grade math classes at Velarde and San Juan Elementary agree—visit their classrooms and you'll see these students at their math practice, and they will openly tell you that their favorite subject is math.

Española is now in its third year of implementing a reform-based mathematics curricula, *Investigations in Time and Space* published by Pearson Inc., *Connected Math Program (CMP)* at the middle school, and Integrated Math Program (IMP) at the high school level, and are now seeing dramatic improvements in students' math achievement on the state tests, particularly at the elementary level. After mastering the new mathematics curriculum that deepens students' understanding of mathematical concepts, the district's teachers are using *First in Math*® to improve students' mathematical skills through deep practice of fundamental mathematical concepts and procedures.

Robert Sun is the first to tell you that the Internet-based program is not a complete mathematics curriculum. It is not meant to replace the current mathematics curriculum. One can't hook the student to the computer and expect the student to understand mathematical concepts. The students' improvement in mathematics is a combination of a doable and guaranteed curriculum, a knowledgeable teacher, and practice, practice, practice. According to Mr. Sun, "You need 10,000 hours of deep, deliberate practice to master a skill."

"The results of combining a concept-based math curriculum like *Investigations* and *Connected Math Project* and a good teacher that understands the math with an online math program that increases student practice like *First in Math*®*,* that immediately provides challenging math problems at recurring levels of difficulty and immediate rewards, are a winning combination," says Carol Brown, a professional development coach with the LANL Math and Science Academy that works with many Española teachers. Brown goes on to say, "The math concepts behind the mathematical operations coupled with hours of students' deep practice is what is making mathematicians of Española elementary students. I was so proud today of our students, teachers, and principals."

This idea of linking deliberate practice and mathematics conceptual knowledge in order to improve students' abilities in math is not just a teacher hunch. Brain researchers support that the focused practice-feedback loop is the single most effective way to build speed and accuracy in any activity (athletes have known this for a long time). But while it is acceptable for coaches to ask their teams to practice dribbling and shooting free throws outside of game time and practice times, it hasn't been publicly supported that teachers can ask their students to practice mathematics in the same way.

Española teachers also get support for their own math practice and instruction from the LANL Math & Science Academy, a professional development program that offers teachers paid opportunities to increase their conceptual understanding of math and science concepts, as well as the latest research on good instruction and assessment, and brain research. The program is going strong after more than 10 years of work in Española and other Northern NM school districts. More than 100 teachers in Española are enrolled in or have already completed the MSA program.

The proof that the combinations of a conceptually based math curriculum, quality math professional development for teachers, and deep practice of fundamental mathematics skills by students is offered by researcher Anders Ericsson. He argues that the differences between expert performers and normal performers reflect long periods of deliberate effort to improve performance in a specific field. Deliberate practice of the right stuff and expert teaching are a winning combination.

More proof that this combination of reform math curriculum, sustained teacher professional development and deliberate practice by students works is in the *History of MSA Activities 2000 to 2009 and Summary Evaluation Report for School Years 2006-2009**. The closing of the achievement gap among the New Mexico Standards-Based Assessment subgroups of American Indian, English Language Learners, and All Students came 2 years after the implementation of reform math curricula and sustained professional development for all Española Public Schools' teachers, and math coaches in 2007.

One may not be able calculate how many times around the globe the millions of problems solved by these math marvels will wrap, but their parents can tell you that they now know where to go to get the answer to the problem—Yes, indeed, Española Elementary Schools.

*Go to: http://www.lanl.gov/education/teachers/mathsci.shtml for complete MSA Report.

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